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Risk factors for suicides of inpatients with depressive psychoses

Abstract Research on identifying the relevant risk factors for suicides is faced with a multitude of methodological problems. The present study attempts to improve on some of these problems and to isolate those risk factors that are accessible in the early stages of the treatment of inpatients. A total of 3792 inpatients with monopolar or bipolar depression were treated during the period 1981–1992. Suicides ($n = 33$) and controls ($n = 3759$) were compared with respect to 77 sociodemographic and anamnestic variables and 195 standardised items of the admission summary. In addition to an analysis of contingency tables a discriminant analysis was performed. The suicide rate of patients with depressive psychosis was 2.7 times higher than the average rate of 0.324% for the entire clinic. Suicidal tendencies on admission proved to be the best predictor with a frequency of 91% in the suicide group and 40% in the control group, previous attempted suicide being the second best predictor. We conclude that the rate of inpatient suicide may have been underestimated for methodological reasons in the past decades. Many of the risk factors discussed in the literature may be of little predictive value at least in the initial stages of hospital treatment.

Key words Affective psychoses · Depression · Psychopathology · Risk factors · Suicide

Introduction

Suicides of people during treatment in a psychiatric hospital, to which they are frequently admitted to prevent that event, is a central problem of public health care. The numbers given for the frequency of inpatient suicides in the past decades range from 72 per 100 000 admissions (Faberow et

al. 1971) to 614 per 100 000 admissions (Bischof 1983); an average suicide rate of approximately 150–250 per 100 000 admissions is reported for European and North American/Australian hospitals (Wolfersdorf 1989). Most inpatient suicides are found among the diagnostic categories of schizophrenia and depression (Achte et al. 1966; Sletten et al. 1972; Schwartz et al. 1975; Copas et al. 1981; Morgan and Priest 1991). The share of depressive patients in the inpatient suicides given in the literature ranges from 11 (Evenson et al. 1982) to 77% (Mitterauer 1981). The reliability and comparability of the data is limited at best, due to a multitude of methodological problems. Heterogeneous populations of patients and different diagnostic procedures in different countries, non-uniform documentation methods with a defensive tendency and different organisational and therapeutic developments in the hospitals while the data were collected influence the suicide rates (Finzen 1983). Empirical studies with control groups on the differentiation between clinical suicides and non-suicides have thus far been exceptional despite a wealth of literature on suicide (Wolfersdorf 1989; Appleby 1992). Study designs that are retrospective as a rule and a small number of cases – a problem from a methodological point of view – are obstacles to identifying reliable predictors. Pertinent investigations include inpatients and discharged patients (Fernando and Storm 1984; Dingman and McGlashan 1986; Morgan and Priest 1991), inpatients and outpatients (Achte 1966; Roy 1982) and inpatients and day-clinic patients (Goh et al. 1989). Modestin and Hoffmann (1989) persuasively demonstrated that the patient status must be taken into consideration because of differences in the distribution of diagnoses; they argued together with other researchers for the examination of groups as homogeneous as possible.

The present study takes up this requirement; it attempts to improve on some of the above methodological problems by selecting a group of depressive inpatients that is homogeneous with respect to diagnosis according to ICD-9 criteria over a period of 12 years and by comparing the group of suicides with the group of the remaining depressive patients on the basis of the standardised AMDP doc-

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umentation system (Guy and Ban 1982; Helmchen 1985). A suicide was regarded as an inpatient suicide if it occurred while the clinic was responsible for a patient's treatment on a ward, regardless of whether the suicide occurred within or without the clinic, during an escape or a short- or long-term leave approved by the therapist.

Method

Sample

The study is based on all 19 158 patients admitted to the psychiatric hospital of the University of Munich during the period from 1981 to 1992. Sixty-two of these patients committed suicide while in the clinic according to the routine documentation of the clinic based on the AMDP system. These data coincide with data on suicides and suicidal acts that were collected immediately after the event from 1983 to 1986 and 1990 to 1992 in the framework of a drug monitoring in parallel to the routine documentation; we are therefore confident that our data on inpatient suicides are complete. From the group of all patients a clinically homogeneous group of depressive patients was formed. All patients with an ICD-9 diagnosis of an affective psychosis were selected excepting those with a monopolar mania or a mania due to a bipolar disorder (ICD-9: 296 without 296.0 and 296.2). From this group all patients with a completed act of suicide during their stay at the clinic were determined ($n = 33$), the control group comprising the remaining patients ($n = 3759$).

Instruments

All patients were routinely documented on admission and discharge with the AMDP system over the period from 1981–1992 and the data were stored in an electronic data processing system. Correct application of the AMDP documentation was ensured by periodic training seminars for the medical staff. The AMDP system, which is considered to be unique in the richness of its phenomenological description, allows a standardised documentation with good reliability (Renfordt et al. 1983; Ahrens and Linden 1996): it contains 77 items for recording sociodemographic and anamnestic information and 195 items for documenting the psychic and somatic state. The sociodemographic and anamnestic data as well as the results of the psychiatric examination on admission were compared. For this study only the absence or occurrence of a symptom was taken into account.

Statistical analysis

Statistical analysis was performed with SPSS for Windows V 6.1 (Microsoft Corp., Seattle, Wa.). Mean values of the metrical items of the AMDP system were determined by means of ANOVA. All other dichotomous, categorial and ordinal items were subjected to an analysis of contingency tables. The test for significance was performed with the χ^2-test according to Pearson and with Fisher's exact test, respectively; a significance level of 5% was assumed. Based on the bivariate results and on clinical considerations, a multivariate analysis was performed to determine the predictive value of those variables which might be useful for the prediction of suicide. They were evaluated by a discriminant analysis with the suicide group and the control group as discriminants and selected sociodemographic, anamnestic and psychopathological variables as discriminators. The discriminators were entered in a single step.

Results

Sociodemographic and clinical variables

A suicide rate of 870 per 100 000 admissions with the specific diagnosis of depressive psychosis is calculated on the basis of 33 patients in the suicide group and 3759 patients in the control group. This rate by far exceeds the rate of 324 suicides per 100 000 admissions calculated for the entire clinic. The suicides were evenly distributed over a period of 12 years. Table 1 provides an overview of important sociodemographic and clinical variables. The mean age of the suicide group was 52.0 years (SD 15.3 years); mean age of the controls was 53.4 years (SD 13.7 years). Most suicides were found in the group of patients in age range 40–49 years. The 33 suicides comprised 6 male and 27 female patients, whereas the control group comprised 989 male and 2770 female patients. This seems to indicate that more suicides occur among female patients; however, this tendency does not have any statistical significance. The number of siblings for the suicides (mean 2.3, SD 1.8) and for the controls (mean 3.2, SD 2.9) was also without statistical significance.

The clinical variables revealed only one significant difference between the groups: previous attempted suicides. Of the suicides, 70% had previously attempted suicide at least once as compared with 26% of the controls. The patients were distributed equally with respect to monopolar and bipolar forms of the affective disorder; neither did we find any significant difference with respect to the duration of illness between the suicides (11.0 years, SD 12.6 years) and the controls (11.5 years, SD 11.4 years). Suicides tend to have undergone psychiatric inpatient treatment more frequently (suicides: mean 2.8; controls: 2.3, SD 2.5) and their last inpatient treatment tended to have occurred less than a year prior more often. Again these results were not of statistical significance. The same is true for the legal basis of the current admission and mean duration of hospitalisation which was at 58.2 days (SD 42.6 days) for the suicides and at 62.6 days (SD 49.6 days) for the controls. The time of the suicides varied between 3 and 178 days after admission with a tendential but not statistically significant cumulation between the ninth and twelfth week after admission.

Symptoms at admission

Table 2 lists some of the 195 items of the AMDP documentation at admission and their frequency in the suicide and control group. Of all symptoms only the item "suicidal tendencies" was found in the suicide group with a significantly higher frequency. Significant differences were also found for three more symptoms which occurred more frequently for the controls: the items "constipation", the item "retarded thinking" and the item "early waking" which in the AMDP system is defined as a distinct change (advancement) in the usual waking time without the ability to go back

Table 1 Sociodemographic and clinical variables

Item	Suicides (n = 33)		Controls (n = 3759)		χ²	p
	n	%	n	%		
Gender						
Male	6	18.2	989	26.3	1.117	0.29
Female	27	81.8	2770	73.7		
Age (years)						
< 20			27	0.7		
20–29	1	3.0	267	7.1		
30–39	4	12.1	457	12.2	9.983	0.08
40–49	13	39.4	713	19.0		
50–59	4	12.1	857	22.8		
> 60	11	33.3	1438	38.3		
Marital status						
Single	3	9.1	667	17.8		
Married	20	60.6	2153	57.4		
Divorced	4	12.1	272	7.3	3.157	0.68
Separated			50	1.3		
Widowed	6	18.2	598	15.9		
Children	19	57.6	2067	55.1	0.081	0.78
Siblings						
None	5	15.2	486	12.9		
1–4	25	75.8	2400	63.8	3.679	0.16
> 4	3	9.1	873	23.2		
Time of last inpatient treatment						
first treatment	9	30.0	907	27.8		
< 1 year	16	53.3	1254	38.4	4.393	0.11
> 1 year	5	16.7	1107	33.9		
Previous attempted suicide	23	69.7	976	26.0	32.117	< 0.001
Abuse or addiction to alcohol or drugs	6	18.2	540	14.4	0.380	0.54
Somatic, psychic or social stress within the past 3 months	21	63.6	2141	57.1	0.574	0.45
Treatment on voluntary basis	31	93.9	3641	97.1	7.510	0.28
Diagnoses (ICD-9)						
296.1	26	78.8	2950	78.5		
296.3	6	18.2	659	17.5	0.084	0.96
Others	1	3.0	150	4.0		

to sleep. Among depressive delusions the item "delusions of guilt" tended to occur more frequently for the suicides as did the item "hopelessness".

Discriminant analysis

Table 3 displays the variables entered into the discriminant analysis together with the standardised coefficient of the first discriminant function in descending order of its modulus. Already the first discriminant function yielded a statistically significant result and explains the total variance (Can Corr = 0.38; χ^2 = 72.713; $p < 0.0001$).

The parameters "suicidal tendencies" at admission and "previous attempted suicides", for which already the analysis of contingency tables revealed a highly significant dif-

ference, are found to have the greatest discriminative power in the discriminant analysis; other clinical parameters and the sociodemographic variables are of minor importance at best. The model allows correct classification of 77% of all cases as compared with an a priori probability of 50% for a class assignment; 86.7% of the suicides and 77% of the controls are classified correctly.

Discussion

According to Berrios and Mohanna (1995) problems such as the definition of suicide, the value of statistical profiles and the way they are put together, and how they are to be interpreted, are far from resolved. The same is true for the more basic question of whether these problems are ame-

Table 2 Selected symptoms from the AMDP admission summary

Item	Suicides (n = 33)		Controls (n = 3727)		χ^2	p
	n	%	n	%		
Formal disorders of thought						
Retarded thinking	4	12.1	1446	38.8	9.825	< 0.01
Delusions						
Delusions of guilt	7	21.2	455	12.2	2.446	0.11
Delusions of improverishment	2	6.1	277	7.4	0.090	0.76
Hypochondriac delusions	3	9.1	221	5.9	0.583	0.44
Disturbances of affect						
Hopelessness	25	75.8	2377	63.8	2.034	0.15
Feelings of inadequacy	22	66.7	2086	56.0	1.519	0.22
Disorders of drive and psychomotility						
Inhibition of drive	22	66.7	2212	59.4	0.726	0.39
Inhibition of psychomotility	4	12.1	775	20.8	1.498	0.22
Other disturbances						
Social withdrawal	21	63.6	2271	60.9	0.100	0.75
Aggressiveness	–	–	147	3.9	1.355	0.27
Suicidal tendencies	30	90.9	1491	40.0	35.187	< 0.001
Disturbances of sleep and vigilance						
Early waking	5	15.2	1305	35.0	5.685	0.02
Gastrointestinal disturbances						
Constipation	1	3.0	642	17.2	4.649	0.031

Table 3 Discriminant analysis

Variables	Standardised coefficient of the discriminant function
Suicidal tendencies	0,57
Previous attempted suicide	0,47
Early waking	–0,33
Retarded thinking	–0,30
Last inpatient treatment > 1 year ago	–0,25
Age	0,24
Constipation	–0,22
No. of siblings	–0,19
Children	–0,09
Married	0,09
No. of inpatient treatments	0,08
Gender (female)	0,07
Single child	–0,07
Somatic, psychic or social stress within past 3 months	0,03
Abuse or addiction to alcohol or drugs	0,03
Duration of illness	–0,01

NOTE: Due to missing items the discriminant analysis was performed on the basis of n = 30 for the suicides and n = 3252 for the controls

nable to an empirical solution at all. Although we do share these doubts, and although we view clinical suicides as multidetermined acts accompanied by psychache in agreement with other researchers (Roy 1985; Shneidman 1993), we believe that besides a therapeutic approach to the problem of suicide an empirical approach is needed. Due to recent progress in psychiatric documentation systems and computer technology, we were able to go beyond a matched-pairs design in this study: we used a large group of patients as a control group. Some disadvantages result in comparison with the usual procedure of retrospective evaluation of medical records: data on the clinical situation immediately before suicide and detailed records on response to treatment were not available. They are, however, outweighed by the advantages for the primary aim of the present study: identifying variables that may help predict suicide very early on during inpatient treatment. Use of well-defined items of the AMDP system together with training medical staff in its application contributes towards improving reliability (Stieglitz et al. 1988): moreover, more complete records on suicidal behaviour are expected to result from the use of a standardised documentation method (Malone et al. 1995).

The suicide rate of 324 per 100000 admissions for the entire clinic is above the mean values of 150–250 per 100000 admissions reported in the literature (Wolfersdorf 1989). Three points should be noted in this connection:

1. Staffing and rooms of our clinic are above average.

2. For the reasons given above we are confident that all suicides have been recorded.

3. The suicide rate was calculated on a per-treatment basis. If we had performed the same calculation on the basis of administrative records of patients, in which weekend leaves are counted as discharges and new admissions, a suicide rate lowered by 42% would have resulted. This

suggests that rates of inpatient suicides have been underestimated in the past; results pointing to an incomplete documentation of inpatient suicides (Blain and Donaldson 1995) as well as recent data from Switzerland and Japan with 452 and 404 suicides per 100 000 admissions (Modestin and Hoffmann 1989; Taiminen and Kujari 1994) lend support to this hypothesis. The disproportionate share of depressive patients in our clinical suicides bears out the well-known high suicide risk of patients with depressive psychoses. Their suicide rate was 2.7 times higher than the average rate for the entire clinic. When comapring our results with other studies, the fact that our clinic has no facilities for long-term treatment of chronic schizophrenic patients should be kept in mind.

For the sociodemographic and clinical variables a significant difference between the two groups was found only for previous attempted suicide, a result that has been previously reported in the literature (Barraclough et al. 1974; Bürk and Möller 1985; Finzen 1988; Modestin and Hoffmann 1989). Of the patients in the suicide group, 70% had attempted suicide at least once as opposed to 26% of the controls. In agreement with Goldney et al. (1985) we found no differences between unipolar and bipolar depressive patients; other researchers have reported a higher suicide risk for bipolar depressive patients (Jamison 1985; Newman and Bland 1991). The variables "number of siblings", "number of children" and "marital status" which may be interpreted as describing social support indicate a higher degree of social withdrawal for the suicide group in the analysis of contingency tables in agreement with other studies (Roy 1982; Vestergaard and Aagaard 1991); no pronounced effects were found in the multivariate analysis. The AMDP documentation system does not provide information on current relationships to one or more partners and their quality, which presently would seem more interesting than marital status. Consequently, a more sophisticated approach is required for studying the influence of a patient's network and life events on suicidal behaviour (Thomsson and Möller 1988). This is even more important in light of more recent psychodynamic approaches to understanding suicidal behaviour on the basis of object relation theory and self-psychology (Maltsberger 1991; Higgit and Fonagy 1992).

Reports that clinical suicides occur in the initial stage of treatment most frequently (Crammer 1984; Copas and Robin 1982; Roy 1985; Blain and Donaldson 1995) were not confirmed for our sample of depressive patients. The mean age for suicide of 54 years was only 1.4 years below the age of control group; similarly, no significant difference was found for the mean duration of illness of 11 years. Therefore, a higher risk of suicide in the first year after manifestation of the disorder reported by some authors (Guze and Robins 1970) does not seem to apply to inpatient suicides. Our data are more in agreement with the results of the study by Angst and Stassen (1987) who conclude that the suicide risk of depressive patients is independent of their age and constant for successive depressive episodes. The suicides of our study tend to have undergone psychiatric inpatient treatment more frequently and to have been re-admitted within a shorter period of time. Similar findings were reported by other authors (Roy 1983; Goldney et al. 1985; Modestin 1987; Finzen 1988; Wolfersdorf 1989) and may be typical of inpatient suicides, but according to the results of our discriminant analysis their predictive value is limited.

From the many psychopathological symptoms we investigated, suicidal tendencies at admission turned out to be the best predictor with a frequency of 91% in the suicide group. This result, which at first glance may seem trivial, has not been obtained consistently in other studies and is therefore by no means a forgone conclusion (Finzen 1988; Modestin and Kopp 1988; Wolfersdorf 1989). Furthermore the symptom "suicidal tendencies" was recorded for 40% of our control group. This is in excellent agreement with the 41% determined for a large sample of depressive patients on the basis of the AMDP system in a Berlin study. This bears out the quality of this documentation standard (Haug et al. 1995). In the AMDP system the item "suicidal tendencies" is characterised as follows: suicidal intentions, plans, death wishes, preparations or attempts (Guy and Ban 1982). Apparently, the majority of depressive suicides already have suicidal tendencies when they are admitted rather than developing these symptoms during their stay in hospital. Thus, the symptom "suicidal tendencies" in the comprehensive sense of the AMDP system may be seen as a meaningful screening method that helps to identify patients with a suicide risk at admission. The analysis of the remaining 194 items of the admission summary failed to reveal any psychopathological symptoms which might be used for the reliable identification of potential suicides. Because of the method of our approach, the importance of indicators found by other researchers comparing depressive suicides and non-suicides is not invalidated in any way. Symptoms reported in the literature, such as hopelessness, depressive delusions, loss of interest, social withdrawal, sleep disorders, agitation and restlessness (Roose et al. 1983; Fawcett et al. 1987; Beck et al. 1990; Wolfersdorf 1995), may be relevant in close proximity to a suicide but are not suitable for reliably identifying potential suicides at the beginning of a hospital treatment. Symptoms such as hopelessness or delusions of guilt tended, however, to occur more frequently for patients who would later commit suicide. This agrees with other reports which associate these symptoms with a higher risk of suicide. The item "retarded thinking", which describes formal disorders of thought, together with the items "early waking" and "constipation", discriminated controls from suicides. A higher incidence of constipation among the controls, a somewhat strange result, might be related to previous medications not recorded by our system; alternatively, one might speculate that depressive patients concerned with their digestion are closer to life than to death. For the time being, no clinical significance should be attached to these variables differentiating against later suicide. If these results should be reproducible, these items might be useful in the construction of suicide-risk scales for high-risk groups advocated by other researchers previously (Motto et al. 1985; Kurz et al. 1988).

There is agreement among researchers on suicide that inpatient suicides cannot be prevented completely even under optimal conditions. Identifying high-risk patients as early and as reliably as possible might, however, contribute towards decreasing its frequency. In that respect we consider our results unsatisfactory. Despite our efforts with respect to methodology, we were unable to identify variables in the admission summary other than suicidal tendencies and previous attempted suicides which permitted a clear differentiation of patients with depressive psychoses in suicides and non-suicides. Building on these results we are currently attempting to isolate further relevant discriminating factors through an in-depth analysis of the relevant medical histories. Our current findings stress the importance of a comprehensive and repeated assessment of suicide risk right from the beginning of an inpatient treatment, of making clinical assessments on an individual basis and of avoiding mechanical procedures. We believe that for suicide research there is a realistic prospect that progress in psychiatric diagnostics and documentation will lead to more accurate records on suicide, and will thus afford a basis for more comprehensive studies comprising larger groups of patients and with respect to methodology, permitting a control of already known risk factors.

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